PCT/EP2003/012279

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference C02041WO	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/EP2003/012279	International filing date (*day/month/year*) 04 November 2003 (04.11.2003)	Priority date (*day/month/year*) 08 November 2002 (08.11.2002)
International Patent Classification (IPC) or national classification and IPC C07F 15/00		
Applicant COVION ORGANIC SEMICONDUCTORS GMBH		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 1 sheets, as follows:

      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

   ☒ Box No. I Basis of the report

   ☐ Box No. II Priority

   ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   ☐ Box No. IV Lack of unity of invention

   ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   ☐ Box No. VI Certain documents cited

   ☐ Box No. VII Certain defects in the international application

   ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 08 June 2004 (08.06.2004)	Date of completion of this report 07 February 2005 (07.02.2005)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is language of a translation furnished for the purpose of:

☐ international search (under Rules 12.3 and 23.1(b))

☐ publication of the international application (under Rule 12.4)

☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ The international application as originally filed/furnished

☒ the description:

pages 1-23, as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages 1-22, 24-27, as originally filed/furnished

pages* _____, as amended (together with any statement) under Article 19

pages* 23 received by this Authority on 25 January 2005 (25.01.2005)

pages* _____ received by this Authority on _____

☐ the drawings:

pages _____, as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-27	YES
	Claims		NO
Inventive step (IS)	Claims	1-27	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-27	YES
	Claims		NO

2. Citations and explanations

This report makes reference to the following documents:

D1: WO-A-02068435
D2: EP-A-1191613
D3: EP-A-1238981
D4: WO-A-0215645

D1 describes complexes as intermediate and end products and processes for the preparation thereof, from which the claimed subject matter differs only in that the central atoms are Pd and Pt instead of Rh and Ir, as described in D1, and that the coordination number is 4 (n = 2) instead of 6 (n = 3).

As D2 shows, changing the central atom is associated with a change in the most frequent coordination number (see D2, claim 1 and table 3: Ir, Rh: n = 3; Pd: n = 2). Thus, it follows from D2 that Ir, Rh or Pd are equally suited to applications related to luminescence, the complexes assuming the preferred coordination number.

D2-D4 describe Rh, Ir, Pd and Pt complexes for use in luminescence devices. To synthesize these complexes, the appropriately substituted ligand must first be synthesized

and then coordinated to the metal. Overall, therefore, synthesis represents a very high-cost process.

Providing the complexes (1)-(8) according to the invention as per claims 1-7 makes heterogeneous complexes readily available by simple, often single-stage consecutive reactions (see the description. page 1, line 40 to page 2, line 14).

Compounds (1)-(8) are therefore key intermediates in the synthesis of substituted complexes. A wide range of palladium and platinum complexes can be produced more easily, with better yield and to a higher degree of purity on the basis of these compounds compared with the prior art, since the halogenated complex can be polymerized (see the description, page 17, lines 3-5, and page 20, line 25) or functionalized (see the description, page 20, lines 27-31) using the standard methodology of organic chemistry.

The complexes (1)-(8) were not previously available in this form (see the description, page 2, lines 16-24) and could not have been derived by a person skilled in the art from D1, since D1 does not show any suitable method whereby such complexes could be obtained.

Providing these complexes is therefore of great technical importance to a person skilled in the art. Providing the complexes according to the invention solves the problem. None of the citations D1-D4 would give a person skilled in the art the teaching that such key intermediates enable palladium and platinum complexes capable of emission to be prepared with better yield and to a higher degree of purity. Consequently, the present invention also involves an inventive step.

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D1-D4 should have been acknowledged in the description.